

CLAIMS

1. Device for monitoring the water resistance of a case (2) of an electronic timepiece (1) including a time base (42) for generating a standard frequency signal and a central processing unit (44) for determining the time from the standard signal, characterized in that it includes an electronic sensor (32) capable of measuring  
5 fluctuations in the concentration of a gas in the atmosphere contained in the case (2), the results of the measurement carried out by the electronic sensor (32) being processed by the central processing unit (44) which, in response to the measurement signal, emits, if necessary, an acoustic or visual warning alarm.
2. Device according to claim 1, characterized in that the sensor (32)  
10 includes means for measuring said concentration continuously or intermittently and generating an alarm signal as soon as it detects a fluctuation in the value of the concentration of the gas greater than a predetermined value.
3. Device according to claim 2, characterized in that the electronic sensor (32) includes a differential measuring bridge (48).
- 15 4. Device according to any of claims 1 to 3, characterized in that the enclosed space is provided with a valve (36) for forcing gas therein.
5. Device according to any of claims 1 to 4, characterized in that the sensor (32) includes electrical heating means whose role is to keep a thermally and electrically insulated membrane at a constant temperature.
- 20 6. Method of monitoring the water resistance of a case (2) of a timepiece (1), said method being characterized in that it includes the steps consisting of:
  - introducing a gas with an initial concentration into the atmosphere contained in the case;
  - measuring the initial concentration of gas;
  - 25 - continuously or intermittently measuring the concentration of gas, and
  - generating an alarm when the measured concentration of gas is different from the initial concentration of said gas or when the leak rate exceeds a predetermined value.
7. Method according to claim 6, characterized in that before measuring the  
30 concentration of gas, the ambient temperature is measured.
8. Method according to any of claims 6 or 7, characterized in that the case is filled with gas by opening the latter, filling it with gas, then sealing it in a water resistant manner.

9. Method according to any of claims 6 to 8, characterized in that the enclosed space is filled with gas via a valve.

10. Method according to any of claims 6 to 9, characterized in that the gas present in the atmosphere of the enclosed case is a neutral gas.

5        11. Method according to claim 10, characterized in that the concentration of inert gas in the atmosphere of the enclosed case is less than its concentration in the ambient air.

12. Method according to claims 10 or 11, characterized in that the inert gas is carbon dioxide or helium.